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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,444	01/14/2004	**Chi tse Wu**	H0002800US(4015)	7831

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EXAMINER	
MCDONALD, RODNEY GLENN	
ART UNIT	**PAPER NUMBER**
1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/759,444	WU ET AL.	
	Examiner	Art Unit	
	Rodney G. McDonald	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 October 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *67-76* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *67-76* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 67, 70 and 72-76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lu et al. (U.S. Pat. 6,471,831) in view of Kardokus et al. (U.S. Pat. 6,113,761).

Regarding claim 67, Lu et al. teach a three dimensional physical vapor deposition target. The target can comprise a material for metallization such as Ta or Ti or any other material. The target has a shape, the shape includes at least one cup having a first end and a second end in opposing relation to the first end. The first end having an opening extending therein. The cup having a hollow therein. The hollow extending

from the opening in the first end toward the second end. The cup having an interior surface defining a periphery of the hollow. A sputtering surface defined along the interior surface of the cup. The target is monolithic. The target has an exterior surface extending around the second end at rounded corners. (Figs. 1, 3-5; Column 2 lines 41-53)

As to the target comprising a cast ingot the process is given no weight since the product is substantially identical to the claimed subject matter. It should be noted that [E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted)

The differences between Lu et al. and the present claims is that the average grain size of less than or equal to 250 microns is not discussed (claim 67), the target being CuSn with Sn being present from about 100 ppm to about 3 atomic percent (Claim 70), the target being CuAg with Ag being present from about 100 ppm to about 3 atomic percent (Claim 72) and the grain size of the target is not discussed (Claims 73-76).

Regarding claim 67, 73-76, Kardokus et al. teach the grain size of a target to be not more than 50 microns. (Column 8 lines 57-59)

Regarding claim 70, Kardokus et al. teach Sn present with CuSn. Alloying levels typically can be at least about 100 ppm. (Column 5 lines 8-16; Column 5 lines 20-24)

Regarding claim 72, Kardokus et al. teach Ag present with CuAg. Alloying levels typically can be at least about 100 ppm. (Column 5 lines 8-16; Column 5 lines 20-24)

The motivation for utilizing the features of Kardokus et al. is that it allows for forming interconnects on wafers. (Column 2 lines 43-45)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Lu et al. by utilizing the features of Kardokus et al. because it allows for forming interconnects on wafers.

Claim 68 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lu et al. in view of Kardokus et al. as applied to claims 67, 70 and 72-76 above, and further in view of Kulkarni et al. (U.S. Pat. 6,283,357).

The difference not yet discussed is the target material consisting essentially of copper and wherein the target consists essentially of the same material. (Claim 68).

Regarding claim 68, Kulkarni et al. suggest various materials for sputtering targets. Among those materials is suggested copper. (Column 3 lines 35-51)

The motivation for utilizing a copper target is that it allows forming copper interconnects for metallization. (Column 3 lines 35-51)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Kulkarni because it allows for forming copper interconnects for metallization.

Claim 69 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lu et al. in view of Kardokus et al. as applied to claims 67, 70 and 72-76 above, and further in view of Michaluk (WO 00/31310).

The difference not yet discussed is the target being made of tantalum with specific grain size is not discussed (claim 69).

Regarding claim 69, Michaluk et al. teach the grain size of a tantalum target to be not more than 50 microns. (See Abstract)

The motivation for utilizing the features of Michaluk et al. is that it allows for forming uniform films. (See Page 1 lines 27-28

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the features of Michaluk et al. because it allows for forming uniform films.

Claim 71 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lu et al. in view of Kardokus et al. as applied to claims 67, 70 and 72-76 above, and further in view of Pavate et al. (U.S. Pat. 6,391,163).

The difference not yet discussed is utilizing aluminum in the copper target. (Claim 71)

Regarding claim 71, Pavate et al. teach utilizing aluminum ion a copper target. (Column 3 lines 20-29)

The motivation for utilizing the features of Pavate et al. is that it allows for increasing the hardness of the target. (Column 3 lines 20-29)

Therefore, it would have been obvious to one of ordinary skill in the art at the invention was made to have utilized the features of Pavate et al. because it allows for increasing the hardness of the target.

Response to Arguments

Applicant's arguments filed October 14, 2009 have been fully considered but they are not persuasive.

In response to the argument that one of ordinary skill in the art would not combine Fai Lai with the cited prior art because the claims as amended now require "an exterior surface extending around the second end at rounded corners", it is argued that the newly cited reference to Lu et al. teach the now claimed amended subject matter where an exterior surface extends around the second end at rounded corners. (See Lu et al. discussed above)

In response to the argument that one of ordinary skill in the art would not combine Fai Lai with Kardokus because Kardokus does not relate to three dimensional targets, it is argued that since Kardokus relate to targets that one of ordinary skill in the art would utilize the features of Kardokus with Fai Lai since Fai Lai teach the use of targets. (See Kardokus and Fai Lai discussed above)

In response to the argument that Kulkarni teaches the opposite of what Fai Lai teaches, it is argued that since Kulkarni teach target material available for sputtering and since Lu et al. teach the target can be of any material it would be obvious to utilize Kulkarni's target material as the target material in Lu et al. (See Kulkarni and Lu et al. discussed above)

In response to the argument that Michaluk or Pavate do not cure the deficiencies of Fai Lai, Kardokus, alone or in combination, it is argued that the newly cited reference to Lu et al. teach the now claimed amended subject matter where an exterior surface extends around the second end at rounded corners. (See Lu et al. discussed above)

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M-Th with every Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rodney G. McDonald/
Primary Examiner, Art Unit 1795

Rodney G. McDonald
Primary Examiner
Art Unit 1795

RM
February 3, 2010